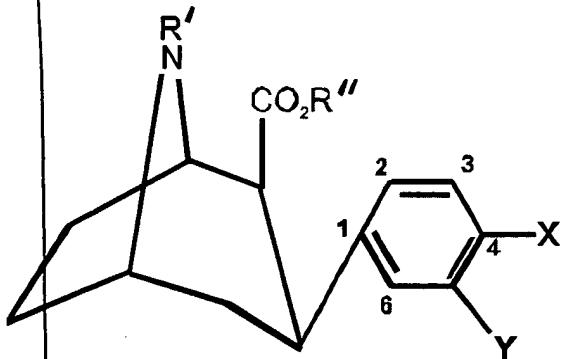


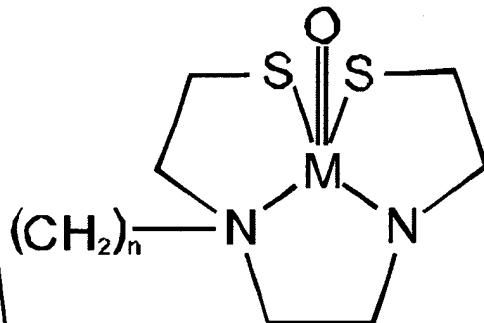
WE CLAIM:

1. A compound of the formula:

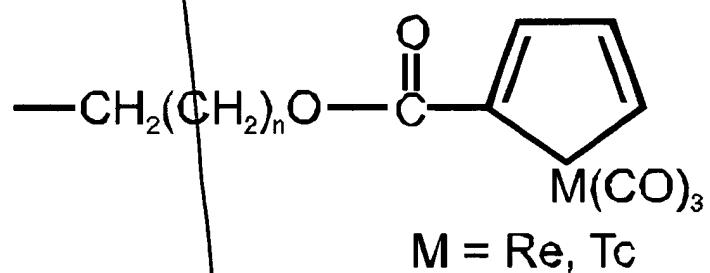
Selvar



wherein X is -CH₂CH₂Q, -CHCHR or -CCH₂FCH₂ and Q is F or CH₂F, R is I, Br, Cl, F or CH₂F; Y is selected from a group consisting of H, F, Cl, Br and I. R' is -CH₃, -CH₂F, CH₂(CH₂)nF,



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M = Tc, Re

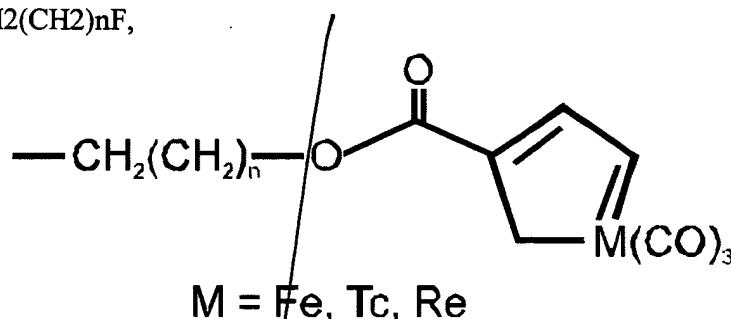


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M = Re, Tc

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R" is -CH₃, CH₂(CH₂)nF,

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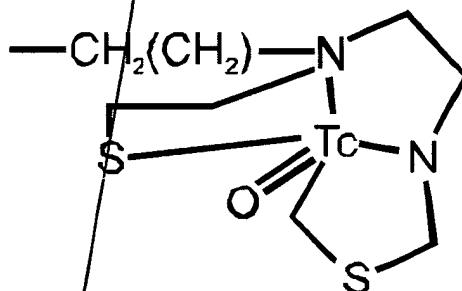


M = Fe, Tc, Re

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Where n is 1-5.



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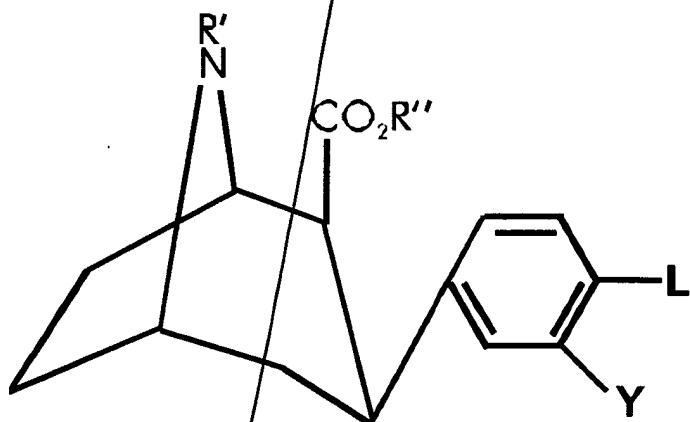
2. The compound of claim 1 wherein at least one halogen is selected from the group consisting of ¹⁸F, ¹²³I, ¹²⁵I, ¹³¹I, ⁷⁵Br, ⁷⁶Br, ⁷⁷Br, and ⁸²Br.
3. The compound of claim 1 wherein X is CH₂CH₂F or CH₂CH₂¹⁸F.
4. The compound of claim 1 wherein X is CH₂CH₂CH₂F or CH₂CH₂CH₂¹⁸F.
5. The compound of claim 1 wherein X is CCH₂FCH₂ or CCH₂¹⁸FCH₂.
6. The compound of claim 1 wherein X is CHCHI.
7. The compound of claim 1 wherein X is selected from the group consisting of CHCH¹²³I, CHCH¹²⁵I and CHCH¹³¹I.
8. The compound of claim 1 wherein X is CHCHCH₂F or CHCHCH₂¹⁸F.
9. The compound of claim 1 wherein X is CCH₂CH₂F or CCH₂CH₂¹⁸F

10. The compound of claim 3 wherein Y is Br.
11. The compound of claim 3 wherein Y is Cl
12. The compound of claim 6 wherein Y is H.
13. The compound of claim 7 wherein Y is H.
14. The compound of claim 8 wherein Y is H
15. The compound of claim 9 wherein Y is H.
16. The compound of claim 10 wherein R' and R" are CH₃.
17. The compound of claim 11 wherein R' and R" are CH₃.
18. The compound of claim 12 wherein R' and R" are CH₃.
19. The compound of claim 13 wherein R' and R" are CH₃.
20. The compound of claim 14 wherein R' and R" are CH₃.
21. The compound of claim 15 wherein R' and R" are CH₃.
22. The compound of claim 18 wherein said compound is a Z isomeric form.
23. The compound of claim 19 wherein said compound is a Z isomeric form.
24. The compound of claim 20 wherein said compound is a Z isomeric form.

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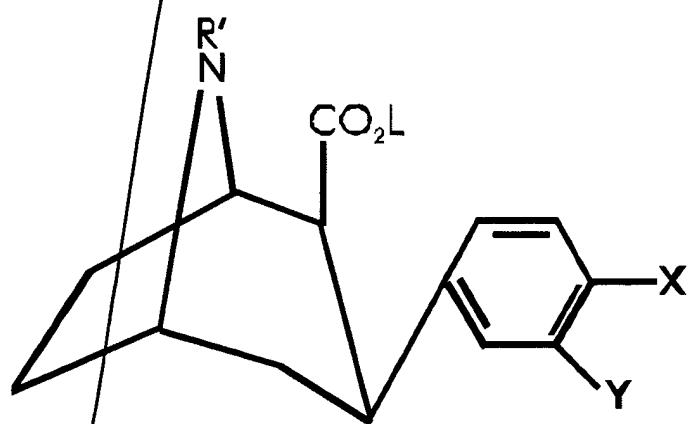
25. A kit for rapid synthesis of a radioactively labeled compound of claim 1, comprising
(a) a compound having the structure:

See page



wherein L is a leaving group which is displaced by a radioactive group, (b) a reagent capable of displacing said L with a substituent containing a radioactive group.

26. The kit of claim 25 wherein said radioactive group is selected from the group consisting of ¹⁸F, ¹²³I, ¹²⁵I, ¹³¹I, ⁷⁵Br, ⁷⁶Br, ⁷⁷Br, and ⁸²Br.
27. A kit for rapid synthesis of a radioactively labeled compound of claim 1, comprising
(a) a compound having the structure:



wherein L is a leaving group which is displaced by a radioactive group, (b) a reagent capable of displacing said L with a substituent containing a radioactive group.

- [Signature]*
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- 30.
- 31.
- 32.
28. The kit of claim 27 wherein said radioactive group is selected from the group consisting of ^{18}F , ^{123}I , ^{125}I , ^{131}I , ^{75}Br , ^{76}Br , ^{77}Br , and ^{82}Br .
29. A method of conducting positron emission tomography or single photon emission tomography imaging of a subject comprising administering to said subject an image-generating amount of a compound according to claim 1 which contains at least one radioactive halogen, and measuring the distribution within the subject of said compound by positron emission tomography or single photon emission tomography.
- The method of claim 29 wherein the halogen is selected from the group consisting of ^{76}Br , ^{75}Br , and ^{18}F , and the distribution of the compound measured by positron emission tomography.
- A method for conducting single photon emission imaging of a subject comprising administering to said subject an image-generating amount of a compound according to claim 1 which contains at least one radioactive halogen, and measuring the distribution within the subject of said compound by single photon emission tomography.
- A method according to claim 31 wherein the compound of claim 1 contains at least one of the following: ^{75}Br , ^{77}Br , ^{123}I or ^{131}I , and measuring the distribution within the subject of said compound by single photon emission tomography.